

REMARKS

Claims 3-9, 11, 13-23, 26, 30-46, 49, 53, 54, 56-66, 70-79, 81, and 84-101 are pending in this application. Claims 1-2, 10, 12, 24-25, 27-29, 47-48, 50-52, 55, 67-69, 80, and 82-83 have been previously canceled. Applicant has amended claims 79 and 94-101 to correct various informalities and to more particularly point out and distinctly claim attributes of the software redirection driver. Support for these amendments can be found in the claims (*e.g.*, independent claim 93) and the text (*e.g.*, Applicant's Specification, Figures 6 and 10; page 16, line 28 – page 19, line 2). No new matter has been introduced by way of these amendments.

Acknowledgement of Cited References

Applicant notes that the Examiner has not yet acknowledged Applicant's Information Disclosure Statement filed on July 3, 2008, and respectfully requests its acknowledgement.

Interview Summary

As a preliminary matter, Applicant wishes to thank the Examiner for his time, observations, and suggestions in a recent telephone interview on September 5, 2008. In that phone conversation, Applicant's representatives discussed the claims relative to the 35 U.S.C. § 103 rejections. The 35 U.S.C. § 103 rejections of claims 3, 72, and 79 over the Harish reference were also discussed.

Claim Objections

The Examiner has objected to claim 94-101 because they recite "[t]he computer-readable medium," whereas claim 93, from which they depend, recites "[a] computer-readable memory medium." Applicant has amended claims 94-101 to recite "[t]he computer-readable memory medium." Thus, Applicant respectfully requests that the Examiner withdraw these objections.

35 U.S.C. § 103 Rejections

The Examiner has rejected claims 3-9, 11, 13-15, 30-40, 53-54, 56-66, 71-79, 81, and 84-101 under 35 U.S.C § 103(a) as obvious over Harish et al., U.S. Patent No. 5,940,850 (hereinafter “Harish”). The Examiner has also rejected claims 16-23, 26, 31, 41-46, 49, 65, and 70 under 35 U.S.C § 103(a) as being obvious over Harish in view of Kobayashi et al., U.S. Patent No. 5,437,018 (hereinafter “Kobayashi”).

Applicant respectfully traverses all these rejections as discussed in detail in prior Amendments/Responses to Office Actions and for the reasons discussed in detail below with respect to both the original and amended claims as indicated. Because Applicant has made minor amendments to the claims in order to place them in better condition for appeal, Applicant has focused the current remarks to respond to the Examiner’s new arguments made in the present Office Action dated September 15, 2008, hereinafter “Office Action.” Applicant notes, however, that the prior arguments asserted in the Amendment filed July 3, 2008 are still applicable and provide additional reasons these claims are allowable.

Response to Examiner’s Arguments with respect to Harish and/or Kobayashi

As a preliminary matter, Applicant thanks the Examiner for clarifying his position with respect to Harish. (Office Action, pp. 2-3.) It appears that the Examiner continues to equate Harish’s virtual memory manager with the “software redirection driver” recited by each of Applicant’s claims. (Office Action, pp. 5-6.) However, as discussed in detail below, the recited “software redirection driver” is both structurally and functionally different from Harish’s virtual memory manager and thus cannot properly be equated.

Specifically, independent claims 3, 32, 54, 84, and 93 (and their respective dependent claims by virtue of their dependencies) each recite a “software redirection driver” that is an “input/output driver” that is not taught, suggested, or motivated by Harish. Thus, each of the these claims recite at least one aspect that is not taught, suggested, or motivated by Harish, and therefore Harish cannot anticipate or render obvious claims 3-9, 11, 13-23, 26, 30-46, 49, 53, 54, 56-66, 70-79, 81, and 84-101.

In particular, claims 3, 32, 54, 84, and 93 recite that, “*the software redirection driver is an input/output driver.*” The Examiner asserts that Harish’s virtual memory manager

can be equated with an “input/output driver,” based on a definition of “input/output driver” as “a program that enables a computer to work with an input/output device.” (Office Action, p. 2, paragraph 3; and p. 5, line 22 – p. 6, line 5.) Regardless of the proffered definition of an “input/output driver,” Applicant respectfully disagrees with the Examiner’s conclusion that Harish’s virtual memory manager can be considered an input/output driver. Specifically, even assuming the Examiner’s definition of “input/output driver” is correct, Harish’s virtual memory manager does not fall within it. Specifically, Harish’s virtual memory manager operates in concert with RAM and ROM, which are not the same thing as an “input/output device” contemplated by the Examiner’s cited dictionary-based definition. RAMs and ROMs are not, under customary usage, considered input/output devices, which fact is supported Harish’s Figure 1 and its associated text, which describe input/output devices as distinct from the illustrated RAM 106 and ROM 104. (Harish, column 3, lines 17-27, hereinafter in col#:line# format, *e.g.*, 3:17-27 (describing the I/O controller as managing devices such as instruments, screen displays, or similar devices, but not describing the I/O controller as managing the RAM 106 or ROM 104).) Harish never defines or otherwise treats the RAM and ROM as input/output devices. Furthermore, Harish only describes the virtual memory manager operating with the RAM and ROM, and not with the various input/output devices he discusses. Simply put, Harish’s virtual memory manager cannot be considered the recited “input/output driver,” or by extension, the recited “software redirection driver” of Applicant’s claims.

In addition, the Examiner appears to assert that, because Harish describes an I/O controller, it somehow follows that the virtual memory manager operates in concert with input/output devices, and therefore that the virtual memory manager can be equated with an “input/output driver.” In particular, the Examiner points to Harish’s I/O controller 108, described with respect to Figure 1, stating that “Harish’s invention is directed toward a memory manager that supports memory accessing to/from the ROM and RAM by external input/output devices.” (Office Action, p. 2, paragraph 3 and p. 6, line 5-9, citing Harish, 3:14-27) However, as discussed above, the I/O controller is only discussed in Harish in the context of managing external devices. More specifically, Harish does not state that the virtual memory manager supports accesses between RAM/ROM and external input/output devices, as the Examiner appears to assert. Furthermore, Harish does not equate the virtual memory manager with the I/O

controller 108, or state that the virtual memory manager is implemented within or as part of the I/O controller 108. The mere mention of an I/O controller as part of a standard computing system does not somehow transform Harish's virtual memory manager into a "software redirection driver" or an "input/output driver." Thus, Harish's I/O controller 108 and virtual memory manager do not teach, suggest, or motivate the recited "software redirection driver."

Furthermore, the Examiner appears to assert that the functions of the virtual memory manager "include" those of an input/output driver, thereby teaching the software redirection driver recited by Applicant's claims. (Office Action, p. 6, lines 10-21.) Specifically, the Examiner states that "the overall functions of the memory manager of Harish is *broader and more complex* than an input/output driver." (Office Action, p. 6, lines 12-14.) It is unclear what the examiner means by "broader and more complex" functions. It is unclear how virtual memory manager functions could be simultaneously more general (*i.e.*, "broad") *and* more detailed (*i.e.*, "complex") than those of an input/output driver. Applicant respectfully requests clarification regarding the Examiner's assertion that the virtual memory manager functions are broader and more complex than those of an input/output driver, and how such a fact, even if true, would teach, suggest, or motivate the software redirection driver aspects recited by Applicant's independent claims.

The Examiner appears to support his assertion that the functions of the virtual memory manager include those of an input/output driver by listing a number of functions that are allegedly performed by the virtual memory manager, such as "performing translating of a virtual address into the corresponding address; accessing physical addresses in ROM or RAM, and intercepting write access and test whether the physical access references data in ROM." (Office Action, p. 6, lines 19-21, internal citations omitted.) However, even if one were to assume that Harish's virtual memory manager performs the listed functions, these functions do not teach, motivate, or suggest several of the aspects of claims 3, 32, 54, 84, and 93 (and their respective dependent claims by virtue of their dependencies). For example, nowhere does Harish describe that the virtual memory manager performs a function to "when the request is to modify a location in the unprotected space, *initiating modification* of the location in the unprotected space without redirection." This type of behavior is simply not within the purview of a memory driver. Thus,

Harish's virtual memory manager cannot be said to include all of the recited functions of the software redirection driver.

In summary, it is unclear how Harish's virtual memory manager, which the Examiner admits is not the same as an input/output driver (see Office Action, p. 7, lines 19-20), and which appears to perform different functions, teaches, suggests, or motivates the recited "input/output driver" or "software redirection driver" of Applicant's claims.

Also, as pointed out above, independent claims 3, 32, 54, 72, 84, and 93 (and their respective dependent claims) recite "when the request is to modify a location in the unprotected space, *initiating modification* of the location in the unprotected space without redirection." Harish does not teach, suggest, or motivate this additional aspect.

In addition, independent claims 3, 32, 54, 84, and 93 recite structural aspects that are not taught, suggested, or motivated by Harish. In particular, claims 3, 32, 84, and 93 recite, "***loading a software redirection driver into an input/output driver hierarchy.***" Claim 54 recites similar language. The Examiner appears to assert that Harish describes an "input/output driver hierarchy comprising software layers for performing translating of a virtual address into the corresponding physical address." (Office Action, p. 6, lines 17-19, citing Harish, 3:57-4:20.) It is respectfully submitted that the Examiner is relying on Harish for more than it teaches or suggests. In particular, the cited passage appears to merely discuss the operation of virtual memory managers as known in the art. Neither the cited passage nor the remainder of Harish describes the virtual memory manager as being loaded "into an input/output driver hierarchy." An input/output driver hierarchy is not mentioned anywhere in Harish. Thus, for at least these reasons and reasons previously put forth by Applicant, Harish does not teach, suggest, or motivate "loading a software redirection driver into an input/output driver hierarchy."

In addition, independent claim 72 recites "***installing the software redirection driver before the device driver in a calling sequence of the operating system.***" The Examiner asserts that it is "inherent that a driver must be installed before it is invoked in a calling sequence." (Office Action, p. 18.) Applicant respectfully traverses the Examiner's "inherency" argument. It is respectfully suggested that the Examiner is not reading all the words of the recited aspect in the context of the claim as a whole and the specification. In particular, the recited aspect is directed to the *location* of the software redirection driver with respect to the

device driver (before the device driver) in a *calling sequence*, and not the *time* at which the software redirection driver is *installed*. This understanding of “calling sequence” is described in the Specification. In particular, Figure 9 shows a “layered I/O driver architecture 901,” with the “Redirection Driver 920 ... shown inserted before the other drivers ...” in location (Applicant’s Specification, Figure 9 and p. 15, lines 11-23) so that it is *called* before the other drivers. Thus, even if the Examiner’s inherency argument were true, it is not directed to the claim language which address ordering in a sequence; thus Harish does not teach, suggest, or motivate the recited aspect.

Furthermore, independent claim 79 (and claim 81 by virtue of its dependency), before and after amendment, recites “***an available space table; a protected space redirection table that is used to designate protected locations on the storage device that are to be protected from modification; an unprotected space table that is used to designate unprotected locations on the storage device that can be altered.***” The Examiner equates Harish’s page table with all three recited tables (the available space table, the protected space redirection table, and the unprotected space table). (Office Action, p. 20, line 22 – page 21, line 6.) In furtherance of prosecution, Applicant has amended independent claim 79, to recite that the three tables are distinct tables. In particular, claims 79 (and 81) as amended recite “***wherein the available space table, the protected space redirection table, and the unprotected space table are separate and distinct from each other.***” Harish’s page table is a single table (see Harish, Figure 2 and associated text) and thus cannot be equated with three “separate and distinct” tables of Applicant’s amended claims 79 and 81. Thus, Harish cannot possibly teach, suggest, or motivate at least two of the “available space table,” the “protected space redirection table,” and the “unprotected space table” as recited by claim 79.

Accordingly, because one or more aspects of each of the independent claims are not taught, suggested, or motivated by Harish, alone or in any motivated combination, claims 3-9, 11, 13-23, 26, 30-46, 49, 53, 54, 56-66, 70-79, 81, and 84-101 are not anticipated or rendered obvious.

Dependent Claims

Each of the pending dependent claims depends on one of independent claims 3, 32, 54, 72, 79, 84, and 93 addressed above. Therefore, each dependent claim incorporates one or more aspects not taught, suggested, or motivated by the corresponding cited references. As such, each of the dependent claims is not anticipated or obvious for at least the reasons discussed above, with respect to its corresponding ancestor independent claim.

Applicant respectfully reminds the Examiner of a number of issues with the standing rejections of various dependent claims. First, Applicant again notes that the Examiner has rejected claims 57 and 71 based upon **previously canceled claim 27**. Second, with respect specifically to claims 7, 34, and 59, the Examiner indicates that the RAM in Harish provides that “the determined location in the redirected space resides in *the* storage device.” However, the Examiner’s reasoning remains unclear. Since the “storage device” contains the protected space (which the Examiner equates to the Harish ROM), it cannot also contain the “determined location in the redirected space,” because there is nothing in Harish to demonstrate or suggest a ROM and a RAM in the same storage device. Further, if the ROM is the storage device recited in the preamble, it is nonsensical for the ROM to contain the RAM. Third, the claim language analyzed by the Examiner with respect to the rejection of claims 26 and 49 **is not the current language of these claims**. (Office Action, p. 27.) Accordingly, the Examiner still has not presented a *prima facie* case for rejecting these dependent claims, and Applicant respectfully requests the Examiner to specifically point out where in the cited references the aspects of each claim are found. (*See also, Ex parte Levy*, 17 U.S.P.Q 2d 1461, 1462 (Bd. Pat. App. & Inter. 1990).).

Other dependent claim rejections present additional issues. Applicant notes for the record that all such assertions of the Examiner are traversed and reserves the right to further present arguments regarding the Examiner’s statements about what is known in the art or taught by the cited references at a later time, should such become necessary. Specifically, no waiver (legal, factual, or otherwise), implicit or explicit, is hereby intended.

Applicant's Previous Arguments with Respect to Harish and/or Kobayashi

To avoid duplication, Applicant is not repeating all of the continued relevant remarks previous submitted in the Amendment filed July 3, 2008, which continue to be relevant. Applicant notes for the record that these previously submitted remarks provide additional reasons that Harish and Kobayashi, alone or in any motivated combination, do not teach, suggest, or motivate various aspects of Applicant's claims. In summary, but not inclusive of all points raised, Applicant previously argued that Harish does not teach, suggest, or motivate the recited "software redirection driver" for at least the following reasons: (1) Applicant's "software redirection driver" processes input/output device accesses; whereas Harish's virtual memory driver processes memory accesses; (2) input/output drivers (such as Applicant's "software redirection driver") and virtual memory manager are typically implemented as distinct and different portions of a typical operating system; (3) virtual memory managers, such as that described by Harish, are typically implemented at least in part in hardware; (4) Harish's virtual memory manager is not loaded into an input/output driver hierarchy as recited by Applicant's claims; and (5) the "intercepting," and other acts/functions recited in claims thereafter, are performed by the driver – not as a result of a page fault or "write-access exception" – which is an error condition raised by the operating system itself. (See, Harish, 4: 15-27.).

In addition, with respect to Kobayashi, the Examiner appears to have not addressed Applicant's comments with regard to the use of the reference and lack of clarity of the rejections. The Examiner continues to mistakenly refer to Hansen instead of Harish, inconsistent with the rejection (see Office Action, pp. 24-27). In addition, several rejections **include language that no longer is recited by the claims** (see, for example, rejections of claims 16, 26 and 49, Office Action, pp. 25, 27). It appears that much of this text may have been inserted from a prior Office Action. As a result, the "motivation" for combining the references is thus incomprehensible in view of the subject matter of Harish (memory management), which is unrelated to storage systems, let alone storage systems with sectors, clusters, etc. Thus, there is **no proper motivation for combining the references**. Therefore, Applicant respectfully submits that the Examiner has failed to put forth a *prima facie* case with regard to claims 16-23, 26, 31, 41-46, 49, 65, and 70 and again requests the Examiner to clarify the rejection of the claims over Harish in view of Kobayashi.

Conclusion

In the event the Examiner disagrees with Applicant or finds minor informalities, Applicant respectfully requests a telephone interview to discuss the Examiner's issues and to expeditiously resolve prosecution of this application. Accompanying this Amendment is an Applicant Initiated Interview Request Form in the event the Examiner does not agree that the claims are allowable over the cited references. Applicant's representative can be contacted at (206) 622-4900.

In closing, Applicant respectfully submits that all of the pending claims are allowable and respectfully requests the Examiner to enter these amendments and to reconsider this application and its timely allowance. The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090. Again, Applicant's representative thanks the Examiner for his prompt and courteous attention.

Respectfully submitted,

SEED Intellectual Property Law Group PLLC



Ellen M. Bierman
Registration No. 38,079

EMB:asl

Enclosures:

Applicant Initiated Interview Request Form
Information Disclosure Statement
Cited Reference

701 Fifth Avenue, Suite 5400
Seattle, Washington 98104
Phone: (206) 622-4900
Fax: (206) 682-6031

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